

We Claim:

1. A reactor for conducting exothermic chemical reactions at substantially isothermal conditions comprising:

a tank reaction vessel having an interior volume for containing an exothermic reaction mixture, thermally conductive reaction vessel walls defining the interior volume of said tank reaction vessel, said thermally conductive reaction vessel walls having an exterior reaction vessel wall surface; and

at least one heat pipe heat transfer device attached to said exterior reaction vessel wall surface.

2. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 1, wherein said heat pipe heat transfer unit is a sealed heat pipe.

3. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 2, wherein said sealed heat pipe is contained within a jacket-type cooler.

4. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 3, wherein said heat pipe heat transfer unit at least substantially circumscribes said tank reaction vessel.

5. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 2, wherein said sealed heat pipe is contained in a jacket-type cooler.

6. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 5, wherein said tank reaction vessel is a batch or a continuous reactor.

7. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 1, wherein said heat pipe heat transfer unit is a thermosyphon heat pipe in fluid communication with a condenser which is not contained within said thermosyphon heat transfer device.

8. The reactor for conducting exothermic chemical reactions at substantially isothermal conditions of claim 7, wherein said condenser has a condensate line in fluid communication with said thermosyphon heat pipe unit.